CLAIMS

Claims 1-67 (cancelled).

68. (new) A non-variance-based method of determining an optimal portfolio from a plurality of portfolios, wherein the steps of the method are performed by computer, a user directing the computer to compute the optimal portfolio, the method comprising the steps of:

a) computing a mark-to-future value for each of the plurality of portfolios,
wherein the mark-to-future value for a portfolio is calculated from mark-to-future values for the instruments in the portfolio, and wherein the mark-to-future value for an instrument is a simulated expected value for the instrument under a future scenario at a time point;

b) for each of the plurality of portfolios, disaggregating the portfolio such that the portfolio is characterized by an upside value and a downside value,
wherein the upside value is the expected value, over a plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized gains of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and a benchmark value where the mark-to-future value of the portfolio exceeds the benchmark value, and
wherein the downside value is the expected value, over the plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized losses of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and the benchmark value where the benchmark value exceeds the mark-to-future value of the portfolio;

c) determining at least one efficient portfolio from the plurality of portfolios,
wherein each efficient portfolio is a portfolio in which the upside value therefor is maximized with the downside value therefor not exceeding a limit of one or more specified limits;

d) obtaining a utility function provided as input, and selecting an optimal portfolio from the at least one efficient portfolio that maximizes the utility function;

wherein the determining step comprises solving a linear program defined by:

$$\text{maximize}(x,u,d)\ p^T u$$

such that

$$\begin{aligned} p^T d &\le k && (\mu) \\ u - d - (M - rq^T)x &= 0 && (\pi) \\ -x &\le -x_L && (\omega_L) \\ x &\le x_U && (\omega_U) \\ u &\ge 0 \\ d &\ge 0 \end{aligned}$$

where

q is the current mark-to-market values of securities;
M is the Mark-to-Future values (M_{ji} = value of security i in scenario j);
p is the subjective prior scenario probabilities;
r is the benchmark growth rates;
x is the position sizes;
x_L is the lower position limits;
x_U is the upper position limits;
d is the portfolio unrealized loss or downside;
u is the portfolio unrealized gain or upside.

69. (new) The method of claim 68, further comprising the step of computing the benchmark value by selecting a benchmark instrument or benchmark

portfolio, and calculating the mark-to-future value of the selected benchmark instrument or benchmark portfolio.

70. (new) The method of claim 68, wherein the utility function is:

$$\text{expected utility} = (\text{upside value}) - \lambda(\text{downside value}),$$

where λ is a constant indicative of a level of risk aversion.

71. (new) The method of claim 68, wherein the determining step comprises solving a mathematical program that incorporates the utility function.

72. (new) The method of claim 68, further comprising the step of determining a price for portfolio insurance associated with the optimal portfolio by pricing a security having payoffs that match the unrealized losses of the optimal portfolio.

73. (new) The method of claim 72, wherein said step of determining the price for portfolio insurance comprises evaluating the formula,

$$\hat{q}_i = \frac{1}{r_o} M^T_{(i)} \rho$$

where $r_o = r^T \rho$,

and wherein $M_{(i)}$ is replaced with the values of the unrealized losses of said optimal portfolio.

74. (new) The method of claim 68, further comprising the step of determining a price for a new security consistent with the optimal portfolio, the new security having a plurality of mark-to-future values associated therewith.

75. (new) A non-variance-based method of determining an optimal portfolio from a plurality of portfolios, wherein the steps of the method are

performed by computer, a user directing the computer to compute the optimal portfolio, the method comprising the steps of:

a) computing a mark-to-future value for each of the plurality of portfolios,
wherein the mark-to-future value for a portfolio is calculated from mark-to-future values for the instruments in the portfolio, and wherein the mark-to-future value for an instrument is a simulated expected value for the instrument under a future scenario at a time point;

b) for each of the plurality of portfolios, disaggregating the portfolio such that the portfolio is characterized by an upside value and a downside value,
wherein the upside value is the expected value, over a plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized gains of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and a benchmark value where the mark-to-future value of the portfolio exceeds the benchmark value, and
wherein the downside value is the expected value, over the plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized losses of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and the benchmark value where the benchmark value exceeds the mark-to-future value of the portfolio;

c) determining at least one efficient portfolio from the plurality of portfolios,
wherein each efficient portfolio is a portfolio in which the upside value therefor is maximized with the downside value therefor not exceeding a limit of one or more specified limits;

d) obtaining a utility function provided as input, and selecting an optimal portfolio from the at least one efficient portfolio that maximizes the utility function;

e) determining a price for portfolio insurance associated with the optimal portfolio by pricing a security having payoffs that match the unrealized losses of the optimal portfolio, wherein said step of determining the price for portfolio insurance comprises evaluating the formula,

$$\hat{q}_i = \frac{1}{r_o} M^T{}_{(i)}\rho$$

where $r_o = r^T\rho$,

and wherein $M_{(i)}$ is replaced with the values of the unrealized losses of said optimal portfolio.

76. (new) The method of claim 75, further comprising the step of computing the benchmark value by selecting a benchmark instrument or benchmark portfolio, and calculating the mark-to-future value of the selected benchmark instrument or benchmark portfolio.

77. (new) The method of claim 75, wherein the utility function is:

expected utility = (upside value) - λ(downside value),

where λ is a constant indicative of a level of risk aversion.

78. (new) The method of claim 75, wherein the step of determining at least one efficient portfolio comprises solving a mathematical program that incorporates the utility function.

79. (new) The method of claim 75, further comprising the step of determining a price for a new security consistent with the optimal portfolio, the new security having a plurality of mark-to-future values associated therewith.

80. (new) A non-variance-based method of determining an optimal portfolio from a plurality of portfolios, wherein the steps of the method are performed by computer, a user directing the computer to compute the optimal portfolio, the method comprising the steps of:

a) computing a mark-to-future value for each of the plurality of portfolios,
wherein the mark-to-future value for a portfolio is calculated from mark-to-future values for the instruments in the portfolio, and wherein the mark-to-future value for an instrument is a simulated expected value for the instrument under a future scenario at a time point;

b) for each of the plurality of portfolios, disaggregating the portfolio such that the portfolio is characterized by an upside value and a downside value,
wherein the upside value is the expected value, over a plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized gains of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and a benchmark value where the mark-to-future value of the portfolio exceeds the benchmark value, and
wherein the downside value is the expected value, over the plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized losses of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and the benchmark value where the benchmark value exceeds the mark-to-future value of the portfolio;

c) determining at least one efficient portfolio from the plurality of portfolios,
wherein each efficient portfolio is a portfolio in which the downside

value therefor is minimized with the upside value therefor being at least a limit of one or more specified limits;

d) obtaining a utility function provided as input, and selecting an optimal portfolio from the at least one efficient portfolio that maximizes the utility function;

wherein the determining step comprises solving a linear program defined by:

$$
\begin{aligned}
&\text{minimize}_{(x,u,d)}\ p^T d \\
&\quad \text{such that} \\
&\qquad p^T u \geq k && (\mu) \\
&\qquad u - d - (M - rq^T)x = 0 && (\pi) \\
&\qquad -x \leq -x_L && (\omega_L) \\
&\qquad x \leq x_U && (\omega_U) \\
&\qquad u \geq 0 \\
&\qquad d \geq 0
\end{aligned}
$$

where

q is the current mark-to-market values of securities;

M is the Mark-to-Future values (M_{ji} = value of security i in scenario j);

p is the subjective prior scenario probabilities;

r is the benchmark growth rates;

x is the position sizes;

x_L is the lower position limits;

x_U is the upper position limits;

d is the portfolio unrealized loss or downside;

u is the portfolio unrealized gain or upside.

81. (new) The method of claim 80, further comprising the step of computing the benchmark value by selecting a benchmark instrument or benchmark portfolio, and calculating the mark-to-future value of the selected benchmark instrument or benchmark portfolio.

82. (new) The method of claim 80, wherein the utility function is:

expected utility = (upside value) - λ(downside value),

where λ is a constant indicative of a level of risk aversion.

83. (new) The method of claim 80, wherein the determining step comprises solving a mathematical program that incorporates the utility function.

84. (new) The method of claim 80, further comprising the step of determining a price for portfolio insurance associated with the optimal portfolio by pricing a security having payoffs that match the unrealized losses of the optimal portfolio.

85. (new) The method of claim 84, wherein said step of determining the price for portfolio insurance comprises evaluating the formula,

$$\hat{q}_i = \frac{1}{r_o} M^T_{(i)} \rho$$

where $r_o = r^T \rho$,

and wherein $M_{(i)}$ is replaced with the values of the unrealized losses of said optimal portfolio.

86. (new) The method of claim 80, further comprising the step of determining a price for a new security consistent with the optimal portfolio, the new security having a plurality of mark-to-future values associated therewith.

87. (new) A non-variance-based method of determining an optimal portfolio from a plurality of portfolios, wherein the steps of the method are performed by computer, a user directing the computer to compute the optimal portfolio, the method comprising the steps of:

a) computing a mark-to-future value for each of the plurality of portfolios,

wherein the mark-to-future value for a portfolio is calculated from mark-to-future values for the instruments in the portfolio, and wherein the mark-to-future value for an instrument is a simulated expected value for the instrument under a future scenario at a time point;

b) for each of the plurality of portfolios, disaggregating the portfolio such that the portfolio is characterized by an upside value and a downside value,
wherein the upside value is the expected value, over a plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized gains of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and a benchmark value where the mark-to-future value of the portfolio exceeds the benchmark value, and
wherein the downside value is the expected value, over the plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized losses of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and the benchmark value where the benchmark value exceeds the mark-to-future value of the portfolio;

c) determining at least one efficient portfolio from the plurality of portfolios,
wherein each efficient portfolio is a portfolio in which the downside value therefor is minimized with the upside value therefor being at least a limit of one or more specified limits;

d) obtaining a utility function provided as input, and selecting an optimal portfolio from the at least one efficient portfolio that maximizes the utility function;

e) determining a price for portfolio insurance associated with the optimal portfolio by pricing a security having payoffs that match the

unrealized losses of the optimal portfolio, wherein said step of determining the price for portfolio insurance comprises evaluating the formula,

$$\hat{q}_i = \frac{1}{r_o} M^T_{(i)} \rho$$

where $r_o = r^T \rho$,

and wherein $M_{(i)}$ is replaced with the values of the unrealized losses of said optimal portfolio.

88. (new) The method of claim 87, further comprising the step of computing the benchmark value by selecting a benchmark instrument or benchmark portfolio, and calculating the mark-to-future value of the selected benchmark instrument or benchmark portfolio.

89. (new) The method of claim 87, wherein the utility function is:

expected utility = (upside value) - λ(downside value),

where λ is a constant indicative of a level of risk aversion.

90. (new) The method of claim 87, wherein the step of determining at least one efficient portfolio comprises solving a mathematical program that incorporates the utility function.

91. (new) The method of claim 87, further comprising the step of determining a price for a new security consistent with the optimal portfolio, the new security having a plurality of mark-to-future values associated therewith.

92. (new) A non-variance-based method of evaluating a portfolio, wherein the steps of the method are performed by computer, a user directing the computer to compute performance measures for the portfolio, the method comprising the steps of:

a) computing a mark-to-future value for the portfolio,
wherein the mark-to-future value for a portfolio is calculated from mark-to-future values for the instruments in the portfolio, and
wherein the mark-to-future value for an instrument is a simulated expected value for the instrument under a future scenario at a time point;

b) disaggregating the portfolio such that the portfolio is characterized by an upside value and a downside value,
wherein the upside value is the expected value, over a plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized gains of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and a benchmark value where the mark-to-future value of the portfolio exceeds the benchmark value, and
wherein the downside value is the expected value, over the plurality of future scenarios, each with an associated probability of future occurrence, of the unrealized losses of the portfolio calculated as the absolute differences between the mark-to-future value of the portfolio and the benchmark value where the benchmark value exceeds the mark-to-future value of the portfolio; and

c) computing one or more performance measures for the portfolio, each performance measure calculated as a function of at least one of the upside and downside values for the portfolio;

wherein the one or more performance measures comprises at least one measure selected from the following group:

i) downside value;
ii) upside value;
iii) upside value – downside value;
iv) upside value / downside value; and

v) upside value – λ(downside value), where λ is a constant indicative of a level of risk aversion.

93. (new) The method of claim 92, further comprising the step of computing the benchmark value by selecting a benchmark instrument or benchmark portfolio, and calculating the mark-to-future value of the selected benchmark instrument or benchmark portfolio.

94. (new) The method of claim 92, further comprising the steps of:

repeating steps a) through c) for each portfolio in a plurality of portfolios;

ordering the plurality of portfolios according to at least one of the one or more performance measures; and

selecting a portfolio from the ordered portfolios.